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SURVEY OF

MEXICAN

Vegetable and Melon Production

UNITED STATES DEPARTMENT OF AGRICULTURE • FOREIGN AGRICULTURAL SERVICE • FAS-M 178 • JULY 1966

MEXICO: VEGETABLE GROWING AREAS
★ Fresh Vegetables
✱ Processed Vegetables
* Melons
International boundary
Estado or territorio boundary
Zone boundary
Statute Miles
0 50 100 200 300
0 100 200 300 Kilometers
KEY TO ZONES AND ADMINISTRATIVE UNITS
I NORTH
1. COAHUILA
2. CHIHUAHUA
3. DURANGO
4. NUEVO LEÓN
5. SAN LUIS POTOSÍ
6. TAMAULIPAS
7. ZACATECAS
II NORTHERN PACIFIC
8. BAJA CALIFORNIA NORTH
9. BAJA CALIFORNIA SOUTH
10. NAYARIT
11. SINALOA
12. SONORA
III CENTER
13. AGUASCALIENTES
14. FEDERAL DISTRICT
15. GUANAJUATO
16. HIDALGO
17. JALISCO
18. MÉXICO
19. MICHOACÁN
20. MORELOS
21. PUEBLA
22. QUERÉTARO
23. TLAXCALA
IV SOUTHERN PACIFIC
24. COLIMA
25. CHIAPAS
26. GUERRERO
27. OAXACA
V GULF OF MEXICO
28. CAMPECHE
29. QUINTANA ROO (T.)
30. TABASCO
31. VERACRUZ
32. YUCATÁN
UNITED STATES
Mexicali
El Paso
Ciudad Juarez
Río Bravo
Río Grande
Nogales
Hermosillo
Chihuahua
Guaymas
Las Delicias
Nuevo Laredo
Los Mochis
Torreón
Río Bravo
Matamoros
Monterrey
Culiacán
Durango
Mazatlán
Altamira
Tampico
Progreso
Mérida
YUCATAN PENINSULA
Irapuato
Guadalajara
Zamora
Chapingo
Morelia
Mexico City
Campeche
Veracruz
Apatzingán
Iguala
Acapulco
ISTHMUS OF TEHUANTEPEC
GUATEMALA
HONDURAS
BRITISH HONDURAS
GULF OF HONDURAS
EL SALVADOR
GULF OF MEXICO
BAY OF CAMPECHE
GULF OF TEHUANTEPEC
PACIFIC OCEAN
LOWER CALIFORNIA
GULF OF CALIFORNIA
SIERRA MADRE OCCIDENTAL
NORTHERN PLATEAU
SIERRA MADRE ORIENTAL
CENTRAL PLATEAU
SIERRA MADRE DEL SUR
ISLA ÁNGEL DE LA GUARDA
ISLA TIBURON
ISLA CEDROS
Cabo San Lucas
ISLAS TRES MARIAS
ISLA DE COZUMEL
112
104
96
88
32
24
16

FOREWORD

Imports of fresh vegetables and melons from Mexico supply a significant part of U.S. supplies for the winter months, in 1965 amounting to a value of about $50 million. A major part of these Mexican exports are in tomatoes, which accounted for about 60 percent of the total value in 1965.

The $29-million value of tomato imports from Mexico in 1965 equalled that of the U.S. winter crop, produced mostly in Florida. However, some of the Mexican tomatoes imported compete instead with the early part of the U.S. spring crop, which in 1965 was valued at $45 million.

The author has made periodic surveys of the Mexican winter vegetable industry since 1956—the last one in February 1966. It is on the basis of that survey that this study, superseding FAS–M–3, published June 1964, is based.

Growers and importers have been most cooperative in furnishing information. The author is grateful for the assistance of R. H. Bertelson and his staff at Nogales, Arizona, and of Willard T. McNabb and his staff of the Agricultural Marketing Service, U.S. Department of Agriculture, Harlingen, Texas.

The Confederación de Asociaciones Agrícolas del Estado de Sinaloa assisted in the survey, and officials of the Asociación de Agricultores del Rio Culiacán furnished transportation and interpreters in the production areas.

George R. Martin, former Secretary-Manager, West Mexico Vegetable Distributors Association, and his members at Nogales, were most cooperative in providing information on marketing.

J. W. Stewart

J. W. Stewart, Director
Fruit and Vegetable Division

CONTENTS

West Coast of Mexico:
- Geography and climate ---- 1
- Production facilities ---- 1
- Transportation ---- 2
- Growers ---- 2
- Marketing ---- 2
- Tomatoes ---- 2
- Cantaloups ---- 3
- Watermelons ---- 3
- Cucumbers ---- 3
- Other vegetables ---- 4

Apatzingan ---- 4
Mérida ---- 4
Vegetables for canning ---- 4

Survey of MEXICAN VEGETABLE and MELON Production

By A. CLINTON COOK
Fruit and Vegetable Division

Value of fresh winter vegetables and melons from Mexico, imported into the United States, has increased rather rapidly, from $34 million in 1960 to $49 million in 1965. In 1965, tomatoes accounted for 60 percent of this value. During December-April, 1965-66, the volume of tomatoes, cucumbers, and peppers imported was 25-30 percent above that of the same period the season before. Value of vegetable and melon imports in 1966 may be 30 to 40 percent above that of 1965.

Mexican vegetables and melons for export to the United States come mainly from the West Coast, where they have been grown for a number of years. Principally involved are areas in the States of Sonora and Sinaloa as far south as Culiacán. Output of tomatoes, the main vegetable grown, has been gradually moving upward and, in recent years, has decidedly shifted to the stake-grown, vine-ripened product.

Total export value of Mexico's vegetables and melons is over $50 million, with tomatoes accounting for about two-thirds (table 1, p. 6).

Minor changes have been underway, recently, with some expansion both in crops other than tomatoes, and also into another production area. A sharp upward trend has taken place in acreage and production of both cantaloups and watermelons, while cucumber production is also expected to expand in the next few years. With attempts by Yucatan to produce winter vegetables for export, one new area may be added.

West Coast of Mexico

Geography and Climate.—Winter vegetables can be grown in all irrigated coastal valleys of the West Coast of Mexico, from Guaymas to Culiacán. Irrigation of the Pericos Valley just north of Culiacán will start in the fall of 1966, and when it is completed 250,000 new acres will have water. The irrigation systems of the Humaya and Culiacán Rivers will be interconnected so that a total of over 300,000 acres will be assured an adequate water supply. These coastal valleys are only a few feet above sea level. Soils are in general clay loams and require large tractors for deep plowing. Also, heavy application of fertilizers is required here for high yields.

Principal weather factors are frosts, a prolonged summer rainy season, and occasional heavy rains during the growing season. More frequent frost areas north of Los Mochis have caused a substantial shift in acreage to the Culiacán Valley, where over 80 percent of the tomatoes produced in Sinaloa State are now grown. When growers changed from ground to staked or pole tomatoes, this move increased costs per acre more than 300 percent. Thus, the possibility of larger financial losses hastened the concentration of acreage in Culiacán Valley. Early in the season, tomatoes in the Culiacán Valley often will not set fruit because of high temperatures. Thus, tomatoes can be harvested earlier in Guaymas and Los Mochis.

The subtropical climate makes effective control of insects and diseases both expensive and difficult. Insecticides and fungicides must be applied frequently.

Fertilizers are used at planting time and also by side dressing during the growing season—by applying either soluble material in the irrigation water or dry material along the rows. Several growers now have contracts with U.S.-based laboratories to make soil tests before planting and during the growing season. Also, some growers keep imported hives of bees to aid in pollination of cantaloups, and cucumbers and some other vegetables.

All vegetables are grown under irrigation. All growers use ditch irrigation and most of the water is supplied from the recently constructed dams. However, a few growers pump water from wells, instead.

Production Facilities.—Acreage and production are not limited by lack of production facilities other than water. Labor is plentiful, as well. Practically all field and packing shed equipment is imported from the States. The basic insecticides and fungicides are imported, but mixed in Mexico. The shook, labels, and wrapping paper are Mexican-made, but cost as much as they would if imported from the States, or more.

Local interest rates are 12 percent per annum, discounted at time of the loan. The inventory of packing material must be purchased and stored from 6 months to a year before use; this increases costs. These high

interest rates are an added incentive for Mexican growers to make financial arrangements with U.S. firms.

Labor costs have advanced in the past few years. In 1966, the wage for unskilled labor, including social benefits, is $1.72 for an 8-hour day, as compared with $0.80 for a 10-hour day in 1955-56. Despite low wages, most growers mechanize their operations to the greatest extent possible. Social Security adds about 10 percent to wage costs. Every 2 years, there is an increase of about 10 percent in minimum wage levels enacted by law.

Competing crops such as cotton and wheat in Sonora State and sugarcane, wheat, rice, and cotton in Sinaloa, have little effect on vegetable acreage. All vegetable growers follow crop rotation methods, even if this makes it necessary to lease land that has been planted in other crops.

Transportation.—Both rail and highway transportation are good, and competition for hauling vegetables is keen.

Before 1955, all vegetables were shipped by rail. Since that time, most vine-ripe tomatoes and many of the so-called mixed vegetables have been shipped by motor truck. Now, the railroads are making a determined bid to regain some of the lost tonnage by use of mehanically refrigerated rail cars and piggyback trailers. Probably 10 percent of the tomatoes will be hauled by piggyback rail during the 1965-66 season.

Trucks deliver produce from Culiacán to Nogales in 18 hours, railroads in about 40 hours, except for special piggyback trains which take 15 to 20 hours. Trucks cross the border in 2 to 4 hours after arrival, while the train generally arrives in the morning and crosses between 2 and 5 o'clok in the afternoon.

Generally, rail cars move all the way from shipping point to destination in the United States or Canada, while nearly all trucks are unloaded at the importer's warehouse in Nogales, Arizona.

Sheds at shipping point either already have precooling rooms equipped with large fans, or will shortly have them. These rooms hold from 3 to 25 carlots. After the produce is cooled, it is loaded into refrigerated trucks or rail cars.

All importers at Nogales, Arizona, have cold rooms for holding produce at the desired temperature until the produce is reloaded for shipment.

Several years ago, the growers' association known as Confederación de Asociaciones Agrícolas del Estado de Sinaloa (CAADES) built a truck compound about 5 miles south of the border for grade inspection of vegetables. Now the railroad yards are located across the highway from the truck compound. Plant quarantine and custom clearance are performed after the trucks cross the border.

Growers.—The growers' association CAADES has an aggressive program for both production and marketing. The grower-members tax themselves to maintain an office in Culiacán and a field representative at Nogales. In Culiacán they collect information on acreage and production, translate bulletins, and support research and other interests of the growers. However, most of the vegetable growers depend on the importers at Nogales for technical assistance regarding growing and packing and visit research centers in the States, as well. At the Mexican research farm near Culiacán there is little research on vegetables.

An association known as the National Union of Vegetable Growers of Mexico has been formed. This is attempting to extend the marketing regulations maintained at Nogales to all other U.S. ports of entry.

All Mexican vegetables for export are grown on large farms of 200 acres to 1,000 or more. Most of these farms have their own packinghouses.

Marketing.—Mexican growers have financial and marketing arrangements with U.S. firms, many of which have headquarters, or local offices, at Nogales, Arizona. Produce is consigned to these firms and they in turn sell to U.S. or Canadian buyers. On railroad cars of vegetables, the Nogales broker invoices the buyer for the prices of the vegetables f.o.b. Mexican shipping point, the U.S. import duty and an additional 10 cents per package. The latter charge pays a portion of the crossing charges. Truck lots are usually sold f.o.b. Nogales, Arizona, with duty and crossing charges paid by the Mexican shipper or by the Nogales broker.

The selling commission is high by U.S. standards, but the firms in Nogales furnish other services besides selling such as translated reports on crops, weather and markets, as well as supervision of growing, harvesting and packing the vegetables. For truck lots, the commission ranges from 10 to 15 percent, but this includes unloading, holding in cold rooms if necessary, and reloading the produce (table 2, p. 6).

All vegetables are inspected by U.S. Federal-State inspectors, and high minimum-quality standards are required. Car or truck lots failing to meet these standards are not allowed to cross the border. Since grade inspection is limited unless the car or truck is unloaded, CAADES imposes severe penalties on any firm that "plates" or "stacks" a load. The organization can impose fines, can require that all loads be completely unloaded for the balance of the season, or even, for repeated violations, can deny the shipper the right to export any produce for the balance of the season. Sample inspections now fairly represent the entire load.

Tomatoes.—Tomatoes are the most important vegetable grown on the West Coast, and represent about 40 percent of total tonnage. Nearly all the production is now concentrated in Sinaloa, and over 80 percent of this in the Culiacán Valley. The other important areas are Guasava and Bamoa, with about 13 percent, and Los Mochis with about 5 percent. The latter produces

mostly tomatoes for late fall and early winter harvest.

Production of staked tomatoes, which started with 200 acres in 1955-56, will use about 20,000 acres in 1965-66. Ground tomato plantings decreased from 39,000 acres to about 8,000 acres during the same period; a portion of the ground tomatoes are grown for processing. Growers forecast that nearly all production for the fresh market will be from staked plants next season.

For estimating costs of production, growers use as a rule of thumb 12,500 pesos for growing a hectare of staked tomatoes; this cost converts to $400 per acre. This includes no cost for land or harvesting, and only replacement cost for stakes. When all new stakes are purchased, costs are higher.

Planting season for tomatoes is from September to early February and the harvest season from December to early June, with the peak of the latter falling from February through April. The principal varieties of pole tomatoes are: mid-season, Indian River and Culiacán I; late, Manapal and Marion. New varieties are distributed for trials in a number of locations. Generally, varieties adapted to Florida do well in Mexico. Vine-ripe tomatoes are picked each day in warm weather. They are placed in field boxes containing 25 to 30 pounds. These boxes are stacked at the end of the rows and from there hauled by truck to the packing shed.

In 1955, most sheds installed grading machinery for green tomatoes, but this has been replaced with special equipment for handling vine-ripe tomatoes.

The tomatoes 6 x 6 and larger are packed in two-layer wooden flats holding about 22 pounds. Smaller sizes are packed in larger wooden flats containing three or four layers of tomatoes. Vine-ripe fruit is place-packed but not wrapped, while green tomatoes are either wrapped and place-packed in wooden lugs holding about 34 to 38 pounds, or else jumble-packed in fiberboard cartons containing 40 pounds.

A range of 40 to 65 percent—averaging about 55 percent—of the staked tomatoes meet export standards. Those not meeting these standards are partially graded and packed in wooden crates containing about 80 pounds, for sale in the Mexican market.

Yields per acre vary, depending on both weather and market factors. A high yield of export quality tomatoes is 1,200 flats to the acre, but the average is probably about 900 flats.

In March, 1964, vine-ripe tomatoes for export were required to grade 75 percent U.S. No. 1 quality, but most of them graded 85 percent or better U.S. No. 1. Green tomatoes were required to grade 80 percent or better U.S. No. 1. "Sort Outs" packed for the Mexican market almost meet the requirements of U.S. No. 2 grade.

The quality of tomatoes has been materially improved in recent years, primarily because of improved varieties and better fertilization. Growers are now using 16-20-0 and 18-46-0, and sometimes sidedress with 15-15-15. Total application of fertilizer amounts to about 800 pounds per acre. Increased use of phosphorus seems to result in heavier and more solid tomatoes that have thick cell walls. Some growers use 150 pounds of nitrogen, 300 pounds of phosphorus and 150 pounds of potash per acre with some variations according to the soil analysis. Some typical fertilizer costs per short ton are: 16-20-0, $113; 18-46-0, $148; and 15-15-15, $105.

Importers state that they can now deliver vine-ripe tomatoes to any market in the United States, Canada, or Hawaii. At Nogales, tomatoes are segregated by size and color. The riper tomatoes are shipped to nearby markets, and those breaking color are shipped to more distant markets (table 3, p. 7)

Cantaloups.—Cantaloups are Mexico's second largest vegetable crop. Production has increased sharply in recent years. Most cantaloups are grown in Bamoa and in the Culiacán Valley; practically all are grown in Sinaloa.

Melons are planted early in the year, and sometimes the young plants are damaged by frost or rains and may require replanting. The harvest season is usually mid-April to mid-June. It usually ends when heavy shipments start from the Yuma, Arizona district. Growers have imported hives of bees to aid in pollination.

Mildew and virus diseases are the principal problems in growing high-quality melons. However, rats that migrate in from the desert and canefields may also damage mature melons, just before harvest. Yields per acre average about 110 crates of export quality.

The melons are packed in central sheds according to U.S. standards. The best quality melons are exported, the others sold on the Mexican market.

One shipper has completed precooling rooms for 25 carlots of melons. This will result in a saving on top ice in shipping. Ice is not always available during the peak shipping season.

Watermelons.—The acreage of watermelons is about equally divided between Sonora and Sinaloa. Acreage and production have both shown steady inreases.

Virus diseases are the principal problem. Nearly all watermelons grown are the Peacock variety; they are generally small in size, ranging from 15 to 22 pounds.

Many are shipped in staked body trucks to Nogales where they are graded and loaded in larger trucks or in railroad cars.

Cucumbers.—Both acreage and yields per acre of cucumbers have increased sharply in recent years. Many cucumbers are being produced by growers who have had experience in Florida. Most of the cucumbers have been grown in the Culiacán Valley, small quantities at La Cruz about 70 miles south of Culiacán, and at other locations in Mexico where conditions warrant.

Most growers are obtaining 200 to 250 bushels per acre of export quality cucumbers. Also, quality of the cucumbers has been improved. The quantity exported to the United States and to Canada depends in part on price levels during the winter months. Varieties grown are Ashley, Marketer and Stono.

Heavier applications of fertilizer, more frequent irrigations, better control of plant diseases, and pollination by imported bees have been the principal factors in increasing yields and in improving quality.

Other Vegetables.—Other commercial vegetable crops in Mexico are bell and hot peppers, peas, zucchini squash, pole and bush green beans, and eggplant. Production of these vegetables has been relatively stable and tonnage small. Peppers and beans are particularly susceptible to virus diseases. It is unlikely that there will be a substantial increase in production.

Many of these vegetables are used along with tomatoes for mixed loads. Nearly all are shipped by truck and reloaded at Nogales, Arizona. Handling charges, selling commissions, and similar charges are the same as those for vine-ripe tomatoes.

Small quantities of China peas are grown, but the demand is quite limited and prices are high. Harvest and handling costs are high and yields low.

Apatzingan

This area is located about 225 miles west of Mexico City. Frosts are infrequent there, but in some years during January and February there are several days of cloudy and cool weather which retards growth of melon vines. There is little or no rain during the winter months; thus, all crops are irrigated from wells or from the river.

Commercial vegetable production is limited to cantaloups and watermelons. Melons are planted in the fall, with harvest beginning in late January or early February, and the harvest season usually ends in late April. Because of mildew and virus diseases it is both difficult and expensive to grow melons in this area. Because of these production problems, yields per acre of export quality melons are low, averaging about 50 crates. There has been a sharp increase in cotton acreage, which in turn has caused an increase in insect population. Some insects are carriers of virus diseases.

Technical and financial assistance is furnished by U.S. firms, which often supply the chemicals for insect and disease control, and apply them, as well. Even with good cultural practices, growers have not increased yields of export quality melons.

Cantaloups are graded and packed under close supervision of Americans. Melons for export are loaded in railroad cars, and 15,000 to 30,000 pounds of crushed top ice is used for quick cooling. Watermelons are shipped to Laredo either by rail or by farm trucks. If they are shipped by motor truck they are regraded and loaded in railroad cars or large trucks for distribution in either the United States or Canada.

Lower grades, and melons too ripe for export, are sold in the Mexican market. There is a good demand for melons in Mexico, but prices are not high enough to cover production costs.

From January through April, high-quality melons delivered in good condition to U.S. and Canadian markets sell at high prices. However, melons arriving in poor condition usually sell at prices below cost of packing and transportation. Unless new varieties are introduced that will produce higher yields of export-quality melons, it is likely that production in this area will continue to decline. This trend is being accelerated because cotton is generally more profitable, and there is less risk of financial losses than there is in melon production.

During the 1965-66 season, most melons intended for early harvest failed because of unfavorable weather and plant diseases. Growers are searching for other areas where melons for early harvest can be grown more economically.

Merida

The Government of Yucatan is interested in developing a vegetable industry to improve the economy of the State. Several inducements have been offered to spur production of these crops as a replacement for hennequin. Most has been centered around Mérida and the port city of Progreso. Thus far, shipments have been made to Florida ports by small boats only.

The principal crops are cucumbers and eggplant. During the 1965-66 season, the equivalent of 80 carlots of cucumbers and 6 cars of eggplant from Mexico entered Florida ports. It is assumed that most of these vegetables were from Yucatan. Production areas dependent on boat shipments alone are at a disadvantage with areas that can ship daily by motor truck or rail.

Vegetables for Canning

Until recently, vegetable canning in Mexico has been a salvage operation involving surplus vegetables originally intended for the fresh market. Practically none were grown under contract for the special varieties and cultural practices specified for processing.

During the past 5 years, U.S. firms have built—or purchased and rebuilt—several canning plants. For vegetable processing, three are located in the Irapuato area and another in Los Mochis. Other U.S. firms, as well as those now in Mexico, are surveying new areas, but there have been no announcements on construction

of additional plants. There may be some expansion of present plants.

Most firms spend at least 2 years making surveys and doing test planting before locating a plant. After the plant's construction, it requires 3 to 5 years for it to reach the stage of efficient operations. Securing contracts with growers and training them to produce the needed quality is slow. Some firms provide financing to growers, while others do not.

Processors are required to purchase cans and cartons from Mexican manufacturers. There is only one Mexican can maker. Cans cost about 30 percent more than those from U.S. sources and cartons cost 100 percent more than American-made.

Canners are packing a wide variety of vegetables and soups. Tomatoes are the largest volume item, but U.S. cream-style corn and cream of corn soup are popular in the Mexican market. (In past years, only white field corn has been used in Mexico for both fresh and canning uses.) One firm is packing 45 different items; another, in addition to canning vegetables and freezing strawberries, is dehydrating onions and garlic.

Asparagus grows well in this area and its planting is expected to expand sharply in the next few years. Tomatoes generally yield 15 to 20 tons per acre, depending on the amount of rain in June and July. Heavy summer rains terminate the crop.

By growing a wide range of vegetables at different locations and at altitudes ranging from 5,000 to 8,000 feet in the Irapuato area, canners can prolong the canning season. Now most of the canners are continually stopping a line to switch to a different vegetable; this interruption increases their costs of processing.

Nearly all the current pack is sold within Mexico. A relatively small quantity of tomato products has been exported. The Mexican market for processed fruits and vegetables should continue to expand; Mexican imports are severely restricted by high import duties and by embargoes.

Each U.S.-Controlled canning plant maintains an excellent quality control laboratory. Quality of their brand packs in Mexico is comparable to that packed in the States. Also, these plants have developed special packs and seasoning suited to the Mexican market.

They conduct field research both on experimental plots and in cooperation with commercial growers. Most of the current research is limited to varietal trials, fertilizer applications, plant spacing and spray schedules. Yields and quality of a number of crops in the Irapuato-Zamora areas are good, but research indicates that there can be much future improvement.

The rate of expansion of this industry depends on a number of factors. An important one will be the policies of the Mexican Government on foreign investment in food processing and distribution. There is a great need for capital as well as for the organizational ability of experienced firms.

In most areas except Sonora and Sinaloa, growers must be trained to produce the varieties, quality, and timing of harvest needed. It usually requires 3 to 5 years to train enough growers to supply a large canning plant. In Sonora and Sinaloa, this training can probably be accomplished in 1 year as there are a large number of growers producing fresh vegetables for export. However, in these States the range of vegetables that can be grown for processing is more limited than it is at higher elevations.

Most of the research in production and in processing must be done by the processors. While the effort in this direction by both State and Federal government agencies is improving, it will be some time in the future before these agencies can meet the needs of a modern processing industry.

There is sufficient capital available, as well as firms with the capability but industry must be convinced that such a venture will be profitable. The largest potential export markets are the United States and Canada, as many other countries maintain high duties and trade restrictions. The principal advantage in Mexico is a plentiful supply of labor at relatively low wages. Most other costs are about as high as those in the United States, and some are higher.

Even with a concentrated effort, it would require 3 to 10 years to bring production substantially above the Mexican market requirements. The timing would not be the same for all crops. For example, production of tomatoes and sweet corn could be expanded much faster than output of asparagus and fruit crops. There will be a rapid expansion of fruit and vegetable canning during the next 3 years, but it is unlikely that it will substantially exceed the expanding domestic demand.

Table 1.—United States imports of winter vegetables from Mexico
1963–64 and 1964–65

Commodity and year	December	January	February	March	April	May	June	July	Total
	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.	1,000 cwt.
1963–64									
Beans	12.4	17.0	10.3	6.9	17.2	6.8	0.6	0.7	71.9
Cucumbers	44.4	63.1	43.7	22.0	3.7	.1	.1	——	177.1
Eggplant	2.0	3.2	8.0	7.5	4.2	4.8	.4	——	30.1
Melons:									
Cantaloups	——	——	4.0	152.7	278.3	473.7	384.7	3.7	1,297.1
Watermelons	——	5.6	14.8	66.9	81.0	137.9	251.1	11.5	568.8
Other melons	——	——	——	.5	5.2	14.3	1.3	——	21.3
Onions	64.4	90.0	53.1	132.0	20.8	——	——	——	360.3
Peas	5.4	12.2	17.2	14.2	3.9	.2	——	——	53.1
Peppers	11.1	19.6	32.6	32.9	12.4	8.3	2.7	.7	120.3
Squash	2.8	4.5	4.9	4.3	4.7	1.5	1.8	1.0	25.5
Tomatoes	103.5	321.0	519.1	528.3	535.2	347.1	89.9	6.9	2,451.0
1964–65:									
Beans	14.0	28.1	22.9	5.8	9.1	3.8	1.3	1.8	86.8
Cucumbers	37.3	97.9	148.3	4.5	19.6	.8	.1	.6	309.1
Eggplant	5.6	8.7	9.2	8.6	5.2	5.3	.1	.1	42.8
Melons:									
Cantaloups	3.3	4.3	7.3	91.9	511.0	641.7	196.9	3.6	1,460.0
Watermelons	——	4.1	20.7	73.3	142.8	286.8	181.6	.9	710.2
Other melons	——	——	——	——	3.7	37.5	.7	.6	42.5
Onions	19.0	61.2	100.5	99.0	43.3	21.2	13.3	1.3	358.8
Peas	3.1	13.2	14.6	13.8	2.6	.7	——	——	48.0
Peppers	15.7	48.8	48.3	32.3	17.1	9.2	2.5	1.2	175.1
Squash	2.6	14.7	19.0	11.8	4.5	1.5	1.5	1.0	56.6
Tomatoes	93.7	370.5	445.6	577.3	558.7	409.4	106.6	6.1	2,567.9
1965–66:									
Beans	9.7	17.0	8.0	7.4	5.4				
Cucumbers	38.7	102.3	156.8	112.3	43.5				
Eggplant	6.5	11.9	12.7	11.7	5.9				
Melons:									
Cantaloups	1.5	6.5	19.9	156.1	305.7				
Watermelons	3.3	16.9	34.3	83.2	123.3				
Other melons	——	——	——	——	9.3				
Onions	35.9	84.8	79.8	117.7	70.1				
Peas	2.2	4.3	20.9	21.9	6.4				
Peppers	14.6	43.3	69.7	51.7	39.8				
Squash	1.1	8.7	14.9	10.1	4.7				
Tomatoes	127.1	403.2	708.6	688.0	807.6				

Table 2.—Marketing costs per package [1, 2] for specified vegetables, from harvest at Culiacán, Mexico, to Nogales, Arizona, 1966

Item	Tomatoes			Cantaloups	Bell peppers	Cucumbers	Watermelon
Costs, harvesting at Culiacán, Mexico, through loading:	(11-lb. flat) US$ equiv.	(22-lb. flat) US$ equiv.	(31-lb. lug) US$ equiv.	(88-lb. crate) US$ equiv.	(30-lb. crate) US$ equiv.	(50-lb crate) US$ equiv.	(Bulk per ton) US$ equiv.
Picking and hauling	0.19	0.14	0.21	(3)	0.12	(3)	(3)
Packing and container	.55	.43	.52	(3)	.55	(3)	(3)
Precooling	.03	.03	.03	(3)	.03	(3)	(3)
Loading	.02	.02	.02	(3)	.02	(3)	(3)
Total	.79	.62	.78	(3)	.72	(3)	(3)

Table 2.—Marketing costs per package [1, 2] for specified vegetables, from harvest at Culiacán, Mexico, to Nogales, Arizona, 1966—Continued

Item	Tomatoes			Cantaloups	Bell peppers	Cucumbers	Watermelon
Costs, from loading in Mexico to arrival at Nogales, Arizona:	(11-lb. flat) US$ equiv.	(22-lb. flat) US$ equiv.	(31-lb. lug) US$ equiv.	(88-lb. crate) US$ equiv.	(30-lb. crate) US$ equiv.	(50-lb. crate) US$ equiv.	(Bulk per ton) US$ equiv.
Assn. dues (CAADES & UNPH)	.02	.02	.03	0.07	.02	.03	.57
Sinaloa production tax	.03	.03	.04	.08	.03	.06	1.30
Export duty, Mexican	.03	.03	.04	.40	.07	.17	5.71
Freight, Culiacán to Nogales.	.28	.33	.42	.98	.32	.60	25.00
Ice	.00	.00	.00	.28	.08	.00	.00
Custom brokerage (U.S. & Mex.)	.01	.02	.02	.04	.02	.01	1.20
Import duty, U.S.[4]	.36	.46	.65	1.40	.75	1.50	8.00
Grade inspection	.01	.01	.01	.03	.02	.01	.50
Miscellaneous	.02	.02	.02	.22	.08	.05	2.20
Total	.75	.92	1.23	3.51	1.39	2.43	44.48

[1] Flat, lug or crate, as specified. Type of transportation and packages per load, for each, is: Tomatoes (cherry) in 11-lb. flat, trailer/1,800; 22-lb. flat, trailer/1,500; 31-lb. lug, trailer/1,200; cantaloups, railroad car/325; bell peppers, railroad car/735; cucumbers, trailer/840; watermelons, trailer/20 short tons.

[2] Costs for picking through loading were based on average costs for the 1964–65 season and would average slightly higher for the 1965–66 season. Motor trucks charge a flat fee of $500 from Culiacán to Nogales. Thus, differences in loading will result in some variation in costs per package. Hauling by rail piggyback trailers cost $75 less than by highway trailers. The selling commission is 10 to 15 percent of the f.o.b. Nogales, Arizona price. This commission includes unloading and reloading trailers and some supervision on growing and packing in Mexico.

[3] Data not available.

[4] Duties: Tomatoes, 2.1¢/lb. Mar. 1–July 14 and 1.5¢/lb. Nov. 15–last day Feb.; cantaloups, 35% ad. val., Sept. 16–July 31, with f.o.b. value assumed at $4 per crate; peppers, 2.5¢ lb., cucumbers, 3¢/lb. Mar. 1–June 30 and Sept. 1–Nov. 30 and 2.2¢/lb., December 1–last day Feb.; watermelons, 20% ad. val., with value assumed at $40 a ton.

Table 3.—Vegetables shipped to Nogales, by type and U.S. grade, 1964–65 season

U.S. grade and method of transportation:	Tomatoes	Cucumbers	Water-melons	Cantaloups	Peppers	Eggplant	Peas
Shipped by railroad:	Carlot	Carlot	Carlot	Carlot	Carlot	Carlot	Carlot
Canada [1]	550	1	1	1,011	2	0	0
U.S. No. 1	8	54	26	0	38	0	71
U.S. Commercial	1	1	0	54	0	0	0
U.S. No. 2	0	9	0	0	0	1	1
85%–89% U.S. No. 1	741	14	33	591	136	139	125
80%–84% U.S. No. 1	82	5	2	0	13	37	16
75%–79% U.S. No. 1	10	0	3	0	13	2	1
Below 75% U.S. No. 1	9	2	16	10	22	0	2
Total	1,401	86	81	1,666	224	179	216
Shipped by truck:							
U.S. Extra No. 1	0	144	0	0	0	0	0
U.S. No. 1	1,925	537	0	313	15	1	0
U.S. No. 2	0	180	0	3	0	0	0
85%–89% U.S. No. 1	5,886	132	0	43	43	0	0
80%–84% U.S. No. 1	1,186	5	0	2	22	0	0
75%–79% U.S. No. 1	1,024	0	0	1	13	0	0
Below 75% U.S. No. 1	64	1	0	2	26	0	0
Total	10,085	999	0	364	119	1	0

[1] "Canada" means that the produce met Canadian requirements. Only green tomatoes grading 80 percent or better U.S. No. 1 quality and vine-ripe tomatoes grading 75 percent or better U.S. No. 1 quality were permitted to cross the border. Practically no mature green tomatoes were shipped by truck.

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